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PATENT
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REMARKS

In the Office Action under reply, claims 8 and 10 were objected to. By this amendment, claims 8 and 10 are amended to address the Examiner's objection. Accordingly, the objection to claims 8 and 10 has been satisfied and should be withdrawn.

Claims 1-4, 6-8 and 10-11 were rejected as being anticipated by U.S. Patent 4,688,098 (Kon). Kon was relied upon to reject claim 9 under 35 USC 103. The Examiner found the subject matter of claim 5 to be patentable over Kon.

It is respectfully submitted, claim 1, the only independent claim that was examined on its merits, is patentably distinct over Kon for the reasons now discussed. It follows that if claim 1 is patentable, dependent claims 2-11 likewise are patentable over Kon.

Claim 1 recites, inter alia, "an overflow barrier **formed within** said substrate." Examples of this overflow barrier are shown in Figs. 1 and 4. Other examples of the overflow barrier within the substrate are contemplated. In contrast to this overflow barrier as claimed in claim 1, Kon describes a vertical transfer register on substrate 1 (see col. 3, lines 45-53), thus establishing layer 1 as the substrate to be compared to the substrate of Applicants' claim 1. Kon further discloses barrier layer 11 provided on the top surface of photoconductive film 10 which, in turn, overlies insulator layers 5 and 7 that are formed on the top surface of substrate 1. Thus, Kon describes a barrier formed atop several layers that overlie the substrate. This is not an overflow barrier **formed within** the substrate. For this reason alone, the rejection of claim 1 as being anticipated by Kon should be withdrawn.

There are other differences between claim 1 and Kon. In section 3 of the Office Action under reply, the Examiner describes the structure and function of Kon's overflow barrier 11. But, this description is not found in Kon. For example, the Examiner holds that col. 2, lines 5-10

of Kon describe that overflow barrier 11 "discharge[s] unnecessary electric charges of said electric charges." But, Kon does not describe how his barrier layer 11 cooperates with the sensor structure; nor does Kon describe the operation of his barrier layer. The Examiner's description of the function of Kon's layer 11 simply is not found in Kon's specification. Col. 2, lines 5-10 of Kon state that a barrier layer under a transparent electrode, which is the structure shown in Kon's Figs. 1 and 2, "prevent[s] injection of external charge." This "prevention" of external charge is not the same as discharging unnecessary charges, as recited in Applicants' claim 1. Discharging in Kon is performed by electrode 14 -- not the barrier layer 11.

Furthermore, in Kon, electrode 12 is covered by insulating film 13 (col. 4, lines 1-6). Consequently, it is not clear if the region below electrode 12 is the "photosensor region". However, assuming arguendo that the region below Kon's electrode 12 is the photosensor region, in order to meet the terms of Applicants' claim 1, the potential in this photosensor region must be larger than the potential in Kon's transfer portion. Kon's electrodes 4 are described as transfer electrodes (col. 3, line 45), so that the potential above electrodes 4 must be the potential in the transfer portion of Kon's structure. Kon states, at col. 4, lines 26-35:

> In the embodiment shown in FIG. 1, when an excessive charge is generated in film 10, a threshold voltage, e.g., 3 V is supplied from source 15 so as to set electrode 12 at the threshold potential (3 V) of electrode 9. When strong light rays are incident on the sensor, a lateral resistance in film 10 is decreased, and the generated charge can easily flow in electrode 12. The potential at electrode 9 is set to be substantially equal to that at the fourth electrode and will not decrease.

Kon's electrode 9 extends over the transfer portion and an opening is present beneath electrode 12. Since the voltages at electrodes 9 and 12 are the same, Kon states that the potential in the vicinity of his transfer portion remains the same as the potential in the vicinity of what has been assumed herein to be Kon's photosensor region. While Applicants contend that Kon does not describe potentials that are "under" transfer and photosensor portions (as called for by

Applicants' claim 1), it is further argued that Kon simply does not teach "potential under [or, for the purpose of this argument, "potential in"] said transfer portion is formed **smaller** than that formed under said photosensor portion along the depth direction of said substrate...". At best, the potentials in the transfer and photosensor regions of Kon are the same.

Therefore, in view of these differences between Applicants' claim 1 and the teachings of Kon, it is clear that Kon neither anticipates nor renders claim 1 obvious. For the same reasoning, Kon neither anticipates nor renders obvious claims 2-11, all of which include the features recited by claim 1. Accordingly, the withdrawal of the rejections of claims 1-11 is requested.

Turning to specific recitations in claims 2-11, notwithstanding the Examiner's unsupported contention, it is respectfully submitted Kon fails to teach the following features:

Claim 3: "said photosensor portion has one or a plurality of impurity regions formed at its lower portion."

Claim 4: "one or a plurality of second impurity regions formed under said photosensor portion are formed with depths different from that of said impurity region."

Claim 6: "said impurity region is a P type impurity region and said second impurity region is an N type impurity region."

Claim 7: "said potential in said overflow barrier under said transfer portion is smaller than that in said overflow barrier under said photosensor portion." As mentioned above, the potential at Kon's electrode 9 is the same as the potential at electrode 12.

Claim 8: "a region of said overflow barrier under said photosensor portion has a concentration lower than that of a region in said overflow barrier under said transfer portion."

Claim 10: "said substrate is composed of a first substrate and a second substrate formed on an upper layer of said first substrate and which is higher in resistance than said first substrate,

said first substrate being of a first conductivity type and said second substrate being of said first conductivity type or a second conductivity type."

Claim 11: "said first conductivity type is N type and said second conductivity type is P type."

The Examiner's interpretation of Kon, in an effort to find in Kon a disclosure of the aforequoted limitations recited in the independent claims, is not supported by Kon.

The foregoing explains why claims 1-11, all the claims examined on their merits, are in condition for allowance. The rejection of these claims should be withdrawn and notification of the allowance of this application should issue.

Rejoinder and allowance of all claims in this application are respectfully solicited.

Statements appearing above in respect to the disclosures in the cited references represent the present opinions of the undersigned attorney and, in the event the Examiner disagrees with any of such opinions, it is respectfully requested that the Examiner specifically indicate those portions of the references providing the basis for a contrary view.

Please charge any additional fees that may be needed, and credit any overpayment, to our Deposit Account No. 50-0320.

Respectfully submitted,
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